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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HARAN, JOHN T

ART UNIT PAPER NUMBER

1733

DATE MAILED: 08/27/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/989,960

Applicant(s)

LAKE, RICKIE C.

Examiner

John T. Haran

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-49 and 51-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-49 and 51-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment and arguments filed on 7/14/03.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kropp et al (U.S. Patent 5,362,421) in view of Tuttle (U.S. Patent 5,558,679).

Kropp et al disclose a method of conductively interconnecting electronic components by interposing a curable, electrically conductive adhesive composition comprising an epoxy with a glycidoxypropyltrimethoxysilane coupling agent between a first and second electronic component and then curing the adhesive to create an electrically conductive bond that electrically interconnects the first and second components (Abstract, Column 6, lines 1-8). Kropp et al is silent towards one of the electronic components to have a nickel containing metal surface cover.

One skilled in the art would have readily appreciated that it is well known and conventional to electrically interconnect electronic components via an epoxy adhesive wherein one of the electronic components has a metal surface containing nickel, as shown for example in Tuttle (Column 3, lines 60-61), and that Kropp et al are a general teaching for interconnecting electronic parts. It would have been obvious to one of

Art Unit: 1733

ordinary skill in the art at the time the invention was made to connect an electrical component with a nickel containing metal surface to another electrical component in Kropp et al as suggested in Tuttle.

4. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kropp et al in view of Tuttle as applied to claim 45 above, and further in view of Chen et al (U.S. Patent 4,975,221).

Regarding claims 48 and 49, Kropp et al is silent towards the weight percent of epoxy terminated silane, however it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the desired weight percentages of the epoxy terminated silane in the adhesive composition in the method of Kropp et al and only the expected results would be achieved. Furthermore, it is known to have epoxy terminated silane in the specified amounts in an electrically conductive epoxy adhesive, as shown for example in Chen et al (Column 4, lines 1-22) and it would have been obvious to use conventional amounts of adhesion promoter in Kropp et al.

5. Claims 45 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (U.S. Patent 4,975,221) in view of Tuttle (U.S. Patent 5,558,679).

Chen et al discloses a curable epoxy adhesive for use in attaching electrical components together, such as semiconductor die or chips to a substrate, to form a connection wherein the epoxy adhesive contains an electrically conductive filler and an

Art Unit: 1733

epoxy functional silane adhesion promoter (Column 1, lines 5-11 and Column 3, line 59 to Column 4, line 5).

One skilled in the art would have readily appreciated that it is well known and conventional to electrically interconnect electronic components via an epoxy adhesive wherein one of the electronic components has a metal surface containing nickel, as shown for example in Tuttle (Column 3, lines 60-61), and that Chen et al are a general teaching for interconnecting electronic parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect an electrical component with a nickel containing metal surface to another electrical component in Chen et al as suggested in Tuttle.

Regarding claims 48 and 49, Chen et al teach having the adhesion promoter be 0 to 2 percent by weight (Column 4, lines 15-20).

6. Claims 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (U.S. Patent 4,975,221) in view of Tuttle as applied above in claim 45 and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

Chen et al are silent towards the type of silane utilized as the adhesion promoter, however Chen et al do teach any type of epoxy terminated silanes are suitable as the adhesion promoter (Column 4, lines 4-5).

Glycidoxymethoxy silanes are well known and conventional adhesion promoters/coupling agents, as evidenced for example in Tsukagoshi et al, Kropp et al,

Art Unit: 1733

and Inoue et al. Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35).

The reference teaches adding a silane coupling agent to the epoxy in order to strengthening the adhesive interface of the circuits and to improve moisture resistance, such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12).

Kropp et al also teach adding a silane coupling agent to a curable, electrically conductive epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic parts (Abstract, Column 6, lines 1-9). Inoue et al also teach adding a silane coupling agent to a curable epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic components. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a known silane adhesion promoter, such as glycidoxypropyltrimethoxysilane, in the epoxy adhesive in the method of Chen et al.

7. Claims 29, 32-36, and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221).

The rejection can be found in Paragraph 10 of the office action mailed on 2/13/03 (Paper No 10).

8. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as

Art Unit: 1733

applied to claim 29 above, and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

The rejection can be found in Paragraph 11 of the office action mailed on 2/13/03 (Paper No 10).

9. Claims 37, 40-44, and 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tuttle (U.S. Patent 5,646,592).

The rejection can be found in Paragraph 12 of the office action mailed on 2/13/03 (Paper No 10).

10. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tuttle (U.S. Patent 5,646,592), as applied to claim 37 above, and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

The rejection can be found in Paragraph 13 of the office action mailed on 2/13/03 (Paper No 10).

Response to Arguments

11. Applicant's arguments filed on 7/14/03 have been fully considered but they are not persuasive.

Regarding claim 29, there is ample motivation to combine the teachings of Tuttle and Chen. Tuttle teaches using an electrically conductive epoxy adhesive for mounting a battery on a substrate and is silent towards the composition of the adhesive. It is well known and conventional in the electric art when bonding electrical components together with an electrically conductive epoxy adhesive to include an epoxy terminated silane as an adhesion promoter in order to ensure adequate adhesion, as shown for example in Chen. One skilled in the art would have been amply motivated to include an epoxy terminated silane adhesion promoter in the electrically conductive epoxy adhesive of Tuttle in order to ensure adequate adhesion as suggested in Chen.

It is noted that the primary reference need not teach the desirability of the combination and that the suggestion for the desirability of the combination can be provided in the secondary references. In the instant case the secondary reference, Chen, suggests the desirability of modifying the adhesive of Tuttle to include an adhesion promoter in order to ensure adequate adhesion of the electronic components.

Regarding claims 30-31, Tsukagoshi, Kropp, and Inoue are examples that it is well known and conventional to use the claimed epoxy terminated silanes in epoxy adhesives to connect electronic components. There is ample motivation to use a well known and conventional type of adhesion promoter in the adhesive of Tuttle as modified with Chen.

It is noted that if a teaching is well known and conventional in a specific environment then there is ample motivation to use the teaching, one skilled in the art is expected to use and apply conventional knowledge and techniques when applicable, and it would be obvious to incorporate such knowledge and teachings when there is motivation to do so.

Regarding claim 36, Tuttle teaches printed conductive traces but is silent towards the traces being ink, however it is notoriously well known and conventional to use conductive ink to form conductive traces and it would have been obvious to use conventional materials in Tuttle.

It is noted that if a teaching is well known and conventional in a specific environment then there is ample motivation to use the teaching, one skilled in the art is expected to use and apply conventional knowledge and techniques when applicable, and it would be obvious to incorporate such knowledge and teachings when there is motivation to do so.

Regarding claim 51 and 52, there is no impermissible hindsight reconstruction in the rejection. Chen et al teaches having an epoxy functional silane adhesion promoter in an amount less than 2% by weight. Applicant discloses that the desired contact resistances are achieved by using a silane in an amount less than 2% by weight. Both Chen et al and Applicant teach having a silane concentration of less than 2% by weight. One skilled in the art would have readily appreciated that only the expected results would be achieved in Chen et al, i.e. the desired contact resistance, from using the same concentration of silane as Applicant.

Regarding claims 37-49 and 53-56, the same arguments apply for corresponding claims 29-36 and 51-52.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(703) 305-0052**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on (703) 308-2058. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 1733

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



John T. Haran



Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700